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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------------------------------------------------------|-------------|----------------------|-----------------------|------------------|
| 09/893,066 | 06/27/2001 | Roland A. Wood | H0001858 (256.112US1) | 4165 |
| 21186 | 7590 | 10/23/2003 | EXAMINER | |
| SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402 | | | GABOR, OTILIA | |
| | | | ART UNIT | PAPER NUMBER |

2878

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/893,066 | WOOD, ROLAND A. | |
| | Examiner | Art Unit | |
| | Otilia Gabor | 2878 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/07/2003 has been entered.

Claim Objections

2. Claims 1-6 are objected to because of the following informalities: claim 1 contains the grammatically incorrect phrase "pixel elements responsive to selective to colors". Appropriate correction is required.

The balance of claims 2-6 is objected to as being dependent from an objected claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-7, 9-11 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Cooper (U. S. Patent 6,150,930).

Cooper discloses an apparatus and method to assist drivers in ascertaining the driving conditions and environment while driving at night and in low visibility conditions.

The device comprises:

- a dual wavelength focal plane detector 34 comprising:
 - o a first array of infrared sensing pixel elements 52 (see Col.4, lines 8-17, and Fig.4a)
 - o a second array of visible light pixel elements 40, 44, 48 responsive to selective colors (red, green and blue) encountered while driving an automobile such that traffic control colors are optimally sensed (see the abstract and Col.2, lines 2-7 and Figs.4a, 5,6).

Regarding claims 2, 3, 7, 11 the visible pixel elements are selective to the colors red, green and blue respectively, which are the colors aiding in the optimal detection of the traffic control colors. The visible pixel elements 40, 44, 48 are used to sense the selected red, green and blue visible light. The infrared pixel elements 52 are used to sense the infrared radiation incident on the detector pixels.

Regarding claim 4, the detector array is a silicon based detector (CCD), which includes a silicon substrate and silicon photosensor pixels.

Regarding claims 5, 6, 7, the device further comprises filters 39, 47, 43 for selectively passing red, green and blue light to the array of visible light pixel elements 40, 44, 48 (see Col.4, lines 17-31 and Fig.4a).

Regarding claim 9, the device further comprises a heads up display 60 coupled to the detector array 34 for generating a composite image based on the infrared images obtained in the IR video processor 156 and the visible images corresponding to the traffic control colors (red, green, blue) processed in the encoder 58 (see Figs.5, 6).

Regarding claim 10, in operation the device of Cooper is used for providing images on a heads up display 60 for enhancing visibility for night time drivers of vehicles, where the method of obtaining the images displayed on the display 60 comprises:

- sensing infrared radiation incident on the device while driving the vehicle
- sensing selective visible radiation (red, green, blue) corresponding to traffic control colors
- combining the infrared and visible images obtained from sensing the infrared and selective visible radiation to provide a composite image for the display 60 where the traffic control colors are displayed in color (see Col.5, lines 10-68 and Col.6, lines 1-17 and Figs.5, 6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8, 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper and further in view of Ouvrier-Buffer et al. (U. S. Patent 6,320,189).

Regarding claims 8, 12, 13 Cooper, though discloses that commercially available silicon based detectors are used, he fails to specifically describe the arrangement of the infrared and visible pixel arrays, and as such he fails to specify that the infrared pixels are formed above the visible sensing pixels. This limitation, however, constitutes only a matter of design choice since, as clearly shown by Ouvrier-Buffer et al. in Col.2, lines 5-11, the detection of multispectral radiation is conventionally done using detector arrays sensing a first wavelength juxtaposed, adjacent or superimposed on the detector arrays sensing radiation of a second wavelength. As such, a conventional dual wavelength array includes the infrared sensing pixels positioned on top of the visible sensing pixels. Since any conventional detector pixel arrangement is accepted by Cooper, using the arrangement shown by Ouvrier-Buffer would have been obvious to one of ordinary skill in the art at the time the invention was made. Ouvrier-Buffer discloses an IR/visible dual detection array where the visible pixels 11-12 (see Figs.4, 6) are positioned beneath the infrared sensor pixels 10 and thus the arrays are vertically integrated into the monolithic silicon substrate 1. In such an arrangement, the visible light passes through the infrared sensing pixels to arrive at the visible sensors.

Regarding claims 15-18 Cooper fails to specify that the infrared pixels are bolometer pixel elements and that there is a thermally isolating space between the first and second sensor array. However this constitutes only a matter of design choice because he does not specify nor limit the type of infrared sensor pixels that can be used

in his detector, and since he states that any conventionally available silicon based detector will do (see Col.52-64). Thus it would have been obvious to one of ordinary skill in the art to use the conventional pixel arrangement of Ouvrier-Bufferet. Ouvrier-Bufferet uses bolometer sensor elements 10 as the infrared pixels and a thermally isolating layer 23 that thermally isolates the thermal detection part T of the infrared bolometers 10 and the photoelectric detection P of the visible sensors 11-12 (see Figs.4, 6 and Col.2, lines 43-68).

Regarding claim 19, Cooper discloses that the infrared image will be displayed on the display 60 in black and white (monochrome) and the visible light images in color (see Col.5, lines 10-22) as well as that various algorithms are used with matrix 56 to obtain the desired composite image. It also uses the system 130 (processor) to select the algorithm for the image based on the colored light signals with information added from the IR signal, as well as that the specific mixing of the color signals will depend upon the vehicle operating environment and the optimum display characteristics desired by the driver (see Col.5, lines 36-49).

Regarding claim 14 Cooper does not specifically disclose amber as one of the selective colors, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have amber instead of blue as one of the detected colors since that would be more helpful in identifying all the colors of the traffic light and because Cooper, by disclosing that other types of complimentary filters can be used that pass all visible wavelengths but notch out a particular color, does not limit his

invention to detecting only red, green and blue as the selective colors but allows for the detection of other desired colors as well.

Response to Arguments

7. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Burley et al. (U. S. Patent 5,001,558) – night vision camera that superimposes infrared and colored visible images to assist night time drivers;

b. Faska et al. (US 2002/0008191 A1) – multi-color focal plane array with infrared and visible radiation simultaneous detection.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otilia Gabor whose telephone number is 703-305-0384. The examiner can normally be reached on Monday-Friday between 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is

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703-308-0956.

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Otilia Gabor

AU 2878

A handwritten signature in cursive script, reading "Otilia Gabor". The signature is written in dark ink and is positioned below the printed name.